Bally PROFESSIONAL

arcade

EXPANDABLE COMPUTER SYSTEM

PRODUCT DESCRIPTION

- ■ ARCADE VIDEO GAME
- ■ BASIC PROGRAMMING CARTRIDGE
- ■ ZGRASS-32 COMPUTER KEYBOARD

Bally ARCADE video game

The Bally ARCADE has been developed by the leader in
commercial arcade games. It is now available from Astrovision,
Inc. of Columbus, Ohio.

The industries' most complete line of ROM cartridge software
includes the Bally classics: Astro Battle, Football, Tornado
Baseball, Bally Pin, and many more. Cartridges now in production
include the best in sports, space simulations, and strategy
games. And, of course, the ARCADE is still the ONLY home video
game with four built-in games and four player capability.

More control, color, sound effects

The ARCADE gives you more control over the action because it
is the only video game with 8-way hand controls. Joysticks,
knob, and trigger allow software designers to create more
interactive games with more kinds of motion. These games and
other programs on the ARCADE are more colorful, too, because the
complete color spectrum is available with 256 color choices. The
tunes and realistic gunshots are created with a three-channel
music synthesizer and sound effects generator. These features
allow professional designers to create better software on the
ARCADE than on other video games.

Triple processor system

The ARCADE contains three computer processors, operating in parallel for faster motion, better sound, and highest realism on the screen. While other video games use only one, the ARCADE has three processors, costing millions of dollars to develop. Because of this added computing power in the ARCADE, all of the games and other software are more interactive and more fun.

* CPU or central processing unit is the powerful Z-80 computer chip, operating at 1.8 mHz. In addition to the central computer, two custom processors are used in this unique combination.

* VIDEO PROCESSOR, designed specifically for the ARCADE and for Bally's professional arcade systems, operates at 7 mHz and increases the animation speed 20 times. This custom LSI chip handles all color manipulation for better animation effects. With this extra processor, the ARCADE is the only video game with professional, American standard NTSC video output for sharper images on your TV screen and full compatibility with all video recorders and broadcast equipment.

* I/O PROCESSOR, another custom chip, handles the joystick and keypad inputs and creates the sound effects. Full input control includes up to four 8-way joysticks with trigger, four analog to digital converters, and 24-key keypad. This chip also creates the special music and sound effects. Three separate sound synthesizers with both AM and FM noise and a frequency range from 2 Hz to 100 kHz provide the most flexible sound system available in any video game.

Unique 8K ROM library

A library of special software effects are built into the 8K ROM, furnished with every ARCADE. These software routines for color and sound effects are used with all ARCADE plug-in games. Included in the ROM are the Bally classics: Gunfight and Checkmate. This ROM also contains Scribbling and the Calculator.

Expands to BASIC computer, and more.

You can expand the ARCADE two ways. Add the Bally BASIC cartridge and turn your ARCADE into a BASIC computer you can program yourself. Or choose the Zgrass keyboard expansion, and your ARCADE becomes the most powerful personal computer available today.

Bally BASIC programming system

There's no easier way to learn about computers than with the new Bally BASIC system. This plug-in cartridge with built-in audio tape interface converts your ARCADE into a personal computer you can program yourself. Computer Learning Lab, an optional self-teaching system, help you learn programming while you create computer games, electronic music, and video art. The library of BASIC software on inexpensive cassettes expands these applications, and teaches more advanced programming techniques.

Easiest BASIC to learn

This version of BASIC is ideal for learning about computers because you can easily program colors and shapes, music, and sound effects. Simple words like LINE and BOX make drawing on the screen simple and direct. You can select from 256 possible combinations in picking each of the two colors on the screen. The built-in music system converts the keypad into a 3-octave music keyboard, including sharps and flats. You can also create space sounds and other effects by controlling the synthesizer directly in your programs.

Four new features make Bally BASIC more powerful and even easier to use. The audio tape interface is now built into the cassette and operates at 1800 baud. An editor, second array, and a trace command have been added to the language.

* AUDIO CASSETTE INTERFACE lets you save or load programs with your cassette tape recorder. You can load a program in only 10 seconds; and multiple programs may be stored on a single cassette. A standard recorder and audio cable are the only additional equipment required.

* LINE EDITOR makes it easy to change or modify any line in your programs without retyping the complete line.

* TWO ARRAYS simplify storing and retrieving information. The @ array and the * array are used for assembly language programs, program constants, and similar data.

* TRACE FEATURE makes it easy to understand software by showing you exactly what each line in a program does. To trace any program step-by-step, just press the LIST key while a program is running, and the computer will list each line in the program as it carries out the instructions.

ZGRASS-32 computer keyboard

The Zgrass keyboard plugs into the ARCADE to give you a full
typewriter keyboard and number pad. You also get additional
memory with 32K additional RAM and 24K ROM. The additional RAM
gives you more space for creating and storing longer programs.
The additional 24K ROM contains powerful system software that
makes this the easiest computer to use.

With the Zgrass keyboard expansion, your ARCADE becomes the
ideal personal computer and the most powerful system available
for creating graphics on the TV screen.

In addition to meeting all standard home computing
applications and requirements, the Zgrass computer also provides
extended capabilities for creating graphs, visual displays,
interactive teaching systems, advanced video games, business
simulations, electronic music, TV commercials, video titles, and
video animation.

Expansion modules include disks, drawing tablets, monitors,
light pens, and a host of RS-232 accessories.

Easier to use

The Zgrass system is easier to use because this computer
language is not limited to the few words in BASIC. You can learn

to write interesting and useful programs more easily because this graphics system is specifically designed for creating games, graphs, video art, and other visual effects. While you can create some of these effects on other computers, the Zgrass computer makes it easier because the system is designed for immediate use by artists, teachers, businessmen, and musicians with little or no programming experience.

Expandable to over 100K

Over 100K of RAM and ROM memory capacity make the ARCADE with Zgrass keyboard by far the largest personal computer available today. This computing power makes the computer easier for you to use and vastly expands the things you can create.

In standard configuration, the ARCADE provides 4K of screen RAM for dynamic storage of the screen image.

Plug-in cartridges with up to 16K ROM may be used for additional languages, turnkey graphic systems, and other software expansion.

The keyboard contains 32K RAM, expandable to 64K RAM, and 24K ROM. The RAM adds capacity, allowing you to create and use larger programs. The ROM contains two important features: the Zgrass computer language and a complete scientific mathematics package.

Zgrass

The most valuable component in the Zgrass computer keyboard is the 24K ROM containing this unique programming language. You

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will see the difference in the programs you create and in the
software you will be able to purchase for your system.

Zgrass software includes:

* A full-screen text editor

* POINT, LINE , BOX, and CIRCLE commands.

* 160 x 100 pixel resolution in four colors.

* String manipulation including match, concatenation,
replacement, etc.

* Multi-dimensional arrays and string arrays.

* Advanced user-extensibility at several levels.

* Both interpreted and compiled modes.

* Fully automatic storage allocation and reclamation.
Automatic type conversion between integer, floating, and
strings. No need to declare variable types.

Extended math package

Math functions included in Zgrass make this computer ideal
for any scientific application. Unlike many other personal
computers, this system contains the computational power and
accuracy required for serious calculations. At least 100 times
faster than programmable scientific calculators, this system
maintains 13 digit accuracy.

The full math package includes: sine, cosine, tangent,
arctan, arccos, arcsin, power, natural and base ten logarithms,
and square root.

Audio dubbing

Either the TV speaker or your stereo sound system may be used for playing back audio signals on the cassette. This provides complete voice and music capability for CAI, computer adventures, employee training, point-of-purchase display, and many other applications where high quality sound and programs can be combined.

Unlimited expansion with low-cost accessories

The Zgrass computer keyboard is your interface to the many accessories and external systems available today. Two standard RS232 interfaces, two audio cassette interfaces with DC motor control, and a connector for standard floppy disks are all included. These and many other optional accessories simply plug in:

* TV PRINTER creates hard-copy of any screen image, including: business forms, forecasts, graphs, charts, mailing labels, and other publishing or word processing data.

* LIGHT PEN draws directly on the screen as you create artwork, respond to a menu, or interact with other programs.

* BIT PAD digitizer inputs standard artwork, maps, and models in either two or three dimensions for computer display or analysis.

* FLOPPY DISKS let you play back all Zgrass disk software and store your own programs, slide shows, graphs, pictures, text, accounts, and other data on disks.

* DUAL CASSETTES provide low-cost storage of programs, pictures, and other data. All you need to add is one or two

standard casstte recorders; the complete 1800 BAUD interface with
DC motor control is built into the keyboard. At this unusually
high BAUD rate, you can load any program in 80 seconds or less.
The dual DC motor controls let the computer start and stop the
cassettes to merge files or select audio or program data.

     * SLIDE COPIER works with any 35mm SLR to create slides from
your TV screen. You can make graphs and illustrations for slide
shows, or create film animation sequences.

     * SOUND SYSTEM output is standard and connects to the
"tuner" or "aux" input on any audio amplifier. Under computer
control, you can program music or sound effects that are played
through your own sound system. This gives you the full sonic
effects contained in many game and music programs.

Astrovision: your marketing opportunity

     The ARCADE, BASIC cartridge, Zgrass keyboard, and complete
software support are marketed by Astrovision. Dan Dawson,
Astrovision President, recently remarked, "We are totally
dedicated to the personal computing industry." "Our sole purpose
is the continued evolution of computers as business,
professional, and personal instruments." See Dan at CES booth
2501 or contact: Astrovision, 6460 Busch Blvd., Suite 215,
Columbus, OH 43229. 1-800-848-6989

VIDEO GAME FEATURE COMPARISON

	Bally Professional Arcade	APF MP-1000	Atari Video Game	Magnavox Odyssey 2	Mattel Intellivision Game
Four Player Capability	■				
Built-in Games	■	■			
Built-in Calculator	■				
Built-in Keypad	■	■		■	■
Multi TV Channel Select	■		■		■
Removable Hand Controls	■		■		
Remote Game Selection	■	■			
Multi-Processors	■				
Full Keyboard Expansion	■	■			■
Cartridge Storage Bin	■				
Basic Programming Cartridge	■		■	■	■
Built-in Basic Keypad	■			■	
Cassette Program Storage	■				
Pre-programmed Audio Cassettes	■				
Light Pen Connector	■				

COMPUTER FEATURE COMPARISON

	Bally ZGRASS	Atari 800	TRS-80 Color	TI 99/4	Apple II
Ram Included	32K	8K	4K	16K	16K
Ram Expands to	64K	48K	16K	16K	64K
Rom Included	16K	16K	8K	26K	12K
Plug-in Rom Cartridge	16K	16K	16K	30K	0K
Floppy Disk Expansion	incl.	extra	extra	extra	extra
Light Pen Expansion	incl	extra	extra	extra	extra
RS - 232	incl.	extra	incl.	extra	extra
Supplied Languages	BASIC ZGRASS	BASIC	BASIC	BASIC	BASIC
Screen Resolution*	160X 100	380X 192	128X 96	192X 256	280X 192
Color Choices for Highest Resolutions	256	128	8	16	6
Colors Displayed	4	16	4	16	16
Broadcast Quality Video	yes	no	no	no	no
Extended Precision Math Package	yes	no	no	yes	no
Audio Cassettes	Dual	Single	Single	Dual	Single
Number of Processors & Type	3 Z-80, Video,I/O	2 6502 Video	1 6809E	1 TMS9900	1 6502
Inputs	8-way Joystick Analog Button	8-way Joystick Analog Button	2-way Joystick Analog Button	2-way Joystick Analog	2-way Joystick Analog Button
Full Screen Editor	yes	yes	No	No	No

* With Standard Memory Supplied